

Upper Middle Miocene Fan 2 (MM9 F2) Play

Textularia "W" and *Bigennerina* 2 biozones

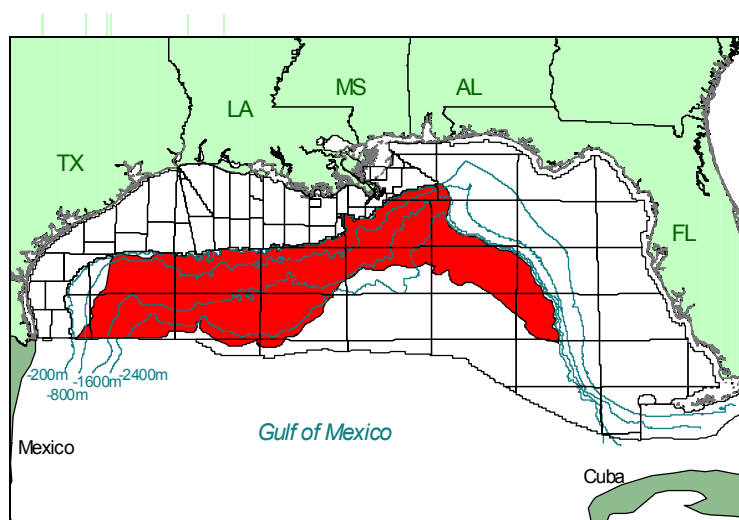


Figure 1. Play location.

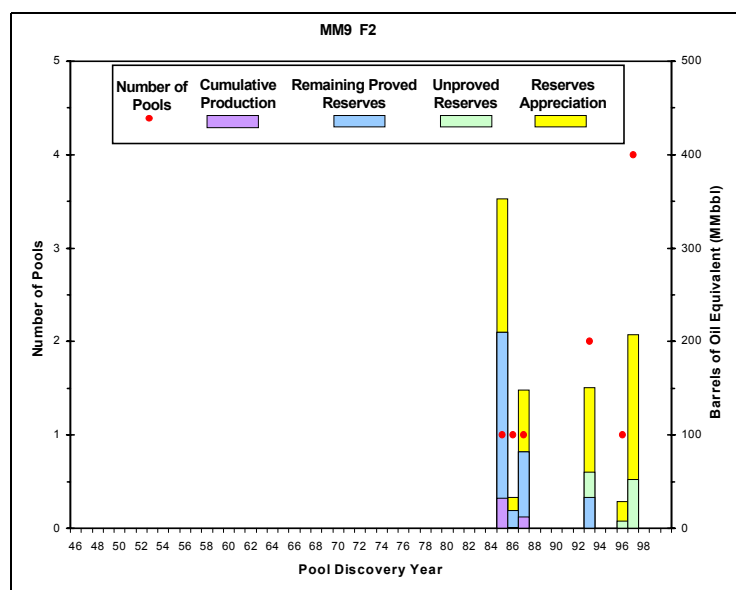


Figure 2. Exploration history graph showing reserves addition and number of pool discoveries by year.

MM9 F2 Play				
10 Pools 27 Sands	Minimum	Mean	Maximum	
Water depth (feet)	689	2745	6590	
Subsea depth (feet)	10056	11979	16312	
Number of sands per pool	1	3	6	
Porosity	21%	26%	29%	
Water saturation	19%	27%	47%	

Table 1. Pool attributes. Values are volume-weighted averages of individual reservoir attributes.

Play Description

The established Upper Middle Miocene Fan 2 (MM9 F2) play occurs within the *Textularia* "W" and *Bigennerina* 2 biozones. The play is also defined by deep-sea fan sediments in a structural regime of allochthonous salt sheets and canopies with intervening salt-withdrawal basins located on the modern Gulf of Mexico Region slope. The MM9 F2 play extends from the Port Isabel, East Breaks, and Alaminos Canyon Areas to the southwestern Destin Dome and southwestern Desoto Canyon Areas east of the present-day Mississippi River Delta, and southeast to The Elbow and Vernon Areas offshore Florida (figure 1).

Updip, the MM9 F2 play is bounded by the Upper Middle Miocene Fan 1 (MM9 F1) play. To the east, the play onlaps the Cretaceous carbonate slope, while to the southwest, the play extends into Mexican national waters. Downdip in the western and central Gulf of Mexico Regions, the MM9 F2 play is limited by the farther downdip occurrence of either (1) the Sigsbee Salt Canopy Escarpment, where the farthest extent of large salt bodies overrides the abyssal plain or (2) the downdip limit of the Perdido Fold Belt or Mississippi Fan Fold Belt plays. Downdip in the eastern Gulf Region, the play is limited by the southern extent of Louann Salt deposition, as defined by the downdip extent of the Upper Cretaceous to Upper Jurassic Salt Roller/High-Relief Salt Structure (UK5-UJ4 S1) play.

Play Characteristics

Component depositional facies include channel/levee complexes, sheet-sand lobes, interlobes, lobe fringes, and slumps deposited on the upper and lower slope, in topographically low areas between salt structure highs, and on the abys-

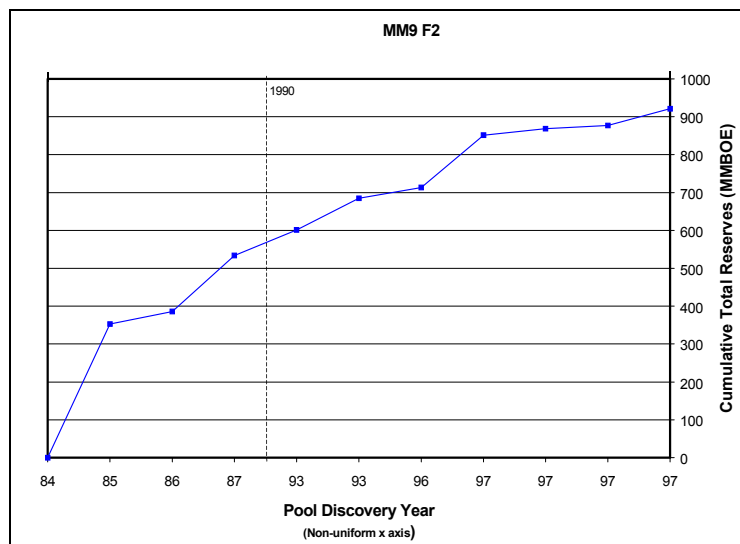


Figure 3. Plot of pools showing cumulative reserves by discovery order. Note the non-uniform x axis.

MM9 F2 Play Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	4	0.147	1.108	0.344
Cumulative production	--	0.028	0.095	0.045
Remaining proved	--	0.119	1.013	0.300
Unproved	6	0.027	0.340	0.087
Appreciation (P & U)	--	0.167	1.813	0.489
Undiscovered Conventionally Recoverable Resources				
95th percentile	--	1.575	9.707	3.424
Mean	80	1.838	12.334	4.033
5th percentile	--	2.153	17.219	5.008
Total Endowment				
95th percentile	--	1.916	12.969	4.345
Mean	90	2.179	15.596	4.954
5th percentile	--	2.494	20.481	5.929

Table 2. Assessment results for reserves, undiscovered conventionally recoverable resources, and total endowment.

sal plain. These deep-sea fan systems are often overlain by thick shale intervals representative of zones of sand bypass on the shelf, or sand-poor zones on the slope.

Hydrocarbon accumulations in the play are stratigraphically trapped around salt bodies by permeability barriers, updip pinchouts or updip facies changes, or structurally, in simple anticlines. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapirism) or stratigraphically (e.g., lateral shale-outs, overlying shales).

Discoveries

The MM9 F2 mixed oil and gas play contains total reserves of 0.341 Bbo and 3.262 Tcfg (0.921 BBOE), of which 0.028 Bbo and 0.095 Tcfg (0.045 BBOE) have been produced. The play contains 27 producible sands in 10 pools, four of which contain proved reserves (table 1; refer to the Methodology section for a discussion of reservoirs, sands, and pools). The first reserves in the play were discovered in the Viosca Knoll 956 (Ram-Powell) field in 1985 (figure 2). Ram-Powell also contains the largest pool in the play with 353 MMBOE in total reserves, which also accounts for the maximum yearly total reserves discovered in the play (figures 2 and 3). All of the play's cumulative production and 58 percent of the play's total reserves have come from pools discovered before 1990. The most recent discoveries, prior to this study's cutoff date of January 1, 1999, were in 1997.

The 10 discovered pools contain 34 reservoirs, of which 16 are nonassociated gas, 13 are undersaturated oil, and 5 are saturated oil. Cumulative production has consisted of 62 percent oil and 38 percent gas.

Assessment Results

The marginal probability of hydrocarbons for the MM9 F2 play is 1.00. The play has a mean total endowment of 2.179 Bbo and 15.596

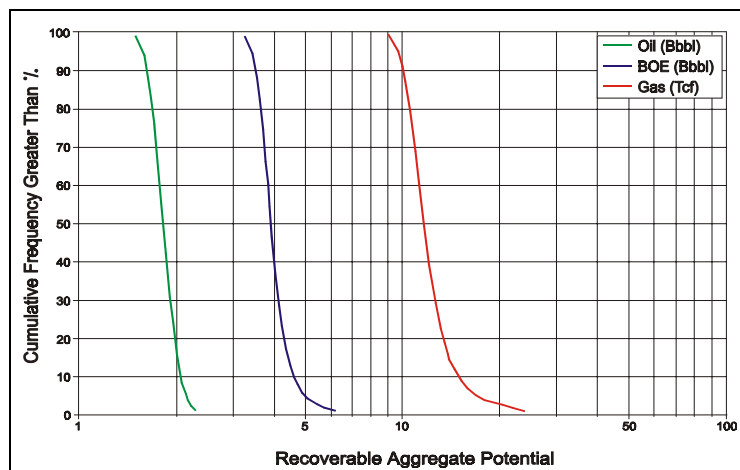


Figure 4. Cumulative probability distribution for undiscovered conventionally recoverable resources.

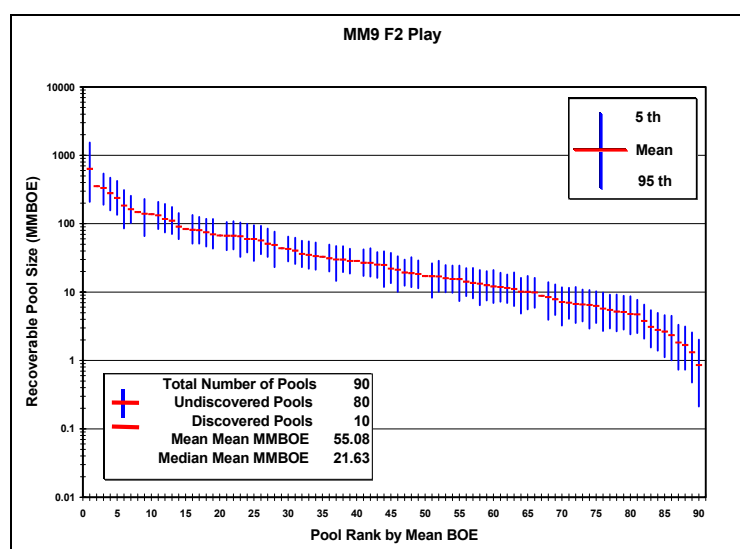


Figure 5. Pool rank plot showing the number of discovered pools (red lines) and the number of pools forecast as remaining to be discovered (blue bars).

Tcfg (4.954 BBOE) (table 2). Only 1 percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered conventionally recoverable resources (UCRR) have a range of 1.575 to 2.153 Bbo and 9.707 to 17.219 Tcfg at the 95th and 5th percentiles, respectively (figure 4). Mean UCRR are estimated at 1.838 Bbo and 12.334 Tcfg (4.033 BBOE). These undiscovered resources might occur in as many as 80 pools. The largest undiscovered pool, with a mean size of 635 MMBOE, is also the largest pool in the play (figure 5). The forecast places the next four largest undiscovered pools in positions 3, 4, 5, and 6 on the pool rank plot. For all the undiscovered pools in the MM9 F2 play, the mean mean size is 50 MMBOE, which is smaller than the 92 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 55 MMBOE.

The MM9 F2 is an immature play with BOE mean UCRR contributing 81 percent to the play's BOE mean total endowment. Only 10 discoveries have been made as of this report's cutoff date and large areas within the play's boundaries remain untested. Ten fields of over 100 MMBOE in total reserves, including four fields of over 200 MMBOE, are forecast as remaining to be discovered. Exploration potential exists in structural and stratigraphic traps near, against, and below salt, as well as in salt withdrawal anticlines (turtle structures).